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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/980,100	03/08/2002	Tatsuya Shimoda	111241	1141

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07/17/2003

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EXAMINER

PHINNEY, JASON R

ART UNIT

PAPER NUMBER

2879

DATE MAILED: 07/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/980,100

Applicant(s)

SHIMODA ET AL.

Examiner

Jason Phinney

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 May 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-29 is/are rejected.
- 7) ☒ Claim(s) 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 March 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.
2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The Applicant claims in Claim 1 an optical path length having a first boundary at a reflective surface of the semi-reflective layer and a second boundary at a point located between the opposing reflective layer and the side of the light emitting means closer to the semi-reflective layer. The specification fails to provide adequate written description detailing the means for moving the point from the reflective surface to within the light-emitting layer. It makes sense to define the optical path length for such a microcavity between two reflective surfaces but in effect the Applicant has also claimed the path length be measured between a point within the light emitting layer and a reflective surface without describing any means for reflecting the light from that point.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the point existing in an interval between the two reflective surfaces must be shown or the feature(s) canceled from the claim(s).

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The Examiner believes that the dashed line at the top of Figure 2 is intended to be this point however it is not labeled as such. The Examiner also requests the Applicant to include lines, similar to those found in the other figures, in order to more clearly designate the regions that the labels are intended to encompass in Figure 2. No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claim 2 is objected to because of the following informalities: Line 4 begins "to of light" the Examiner believes that this was intended to read "to light." Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1, 6 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Lines 19-26 of Claim 1 are unclear as to what the applicant intends to claim. For purposes of examination the Examiner has interpreted this section to mean that the optical path length has a first boundary at a reflective surface of the semi-reflective layer and a second

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boundary at a point located between the opposing reflective layer and the side of the light emitting means closer to the semi-reflective layer, though as explained above it is not clear how Applicant intends to accomplish this.

Regarding Claim 6 it is unclear how the Applicant intends to create the point of Claim 1 within the light-emitting layer

Claim 16 recites the limitation "said light emission point" in Line 4. There is insufficient antecedent basis for this limitation in the claim. The examiner has interpreted this to be the point that defines one end of the optical cavity as claimed in Claim 1.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-4, 8, 9, 12-15, 17, and 19-28 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by U.S. Patent No. 5,554,911 to Nakayama.

Regarding Claim 1, Nakayama discloses a multiple wavelength light emitting device with a light emission means (Figure 3, #105), a reflecting layer (#106) placed in proximity to the light

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emission means, a semi-reflecting layer group (#102) placed in opposition with the reflecting layer with the light emission means located therebetween and wherein the semi-reflecting layers are stacked in order in the direction of light advance so as to correspond with light wavelengths to be output. Nakayama further discloses that there should be two or more light emission regions (Labeled B, G, and R) where the wavelength of output light differs and that the distance between reflective and semi-reflective layers should be adjusted to have an optical path length to allow the wavelength output from that region to resonate (Column 4, Line 60 – Column 5, Line 3).

Regarding Claim 2, Nakayama further discloses that the semi-reflective layer group should have a plurality of types of layers responsive to light of different wavelengths that are placed uniformly without separation between light emitting regions (Column 3, Lines 56-61).

Regarding Claim 3, Nakayama further discloses that the reflective surface of the semi-reflective layer group should be in a different position in a thickness direction for each light-emission region having a different light-emission wavelength (Column 3, Lines 56-61 and Figure 3).

Regarding Claim 4, Nakayama further discloses that the point should be located on the reflecting surface of the reflective layer (Column 2, Lines 13-16)

Regarding Claim 8, Nakayama further discloses that the semi-reflective layer that reflect light of a longer wavelength is positioned on a side nearer to the light emitting device (Column 3, Lines 56-61)

Regarding Claim 9, Nakayama further discloses that the semi-reflective layers that configure the semi-reflective layer group should be configured of two layers of different refractive index stacked alternately (see Column 3, Lines 56-61).

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Regarding Claim 12, Nakayama further discloses that the thickness of one of the semi-reflective layers having different refractive indices may be altered (see Column 3, Lines 56-61).

Regarding Claim 13, Nakayama further discloses that multiple types of light emitting materials may be used (Column 2, Line 56 - Column 3, Line 8).

Regarding Claim 14, Nakayama further discloses that the light-emission layer should be provided commonly for all light emission regions (Figure 3, #105).

Regarding Claim 15, Nakayama further discloses that the light-emission layer should be an organic electroluminescent layer (Column 2, Lines 1-11) sandwiched between electrode layers (#'s 103 and 106) and wherein the electrode provided on the backside should correspond to the reflective layer (#106).

Regarding Claim 17, Nakayama further discloses that there should be a hole transport layer (Figure 3, #104) on the positive electrode side of the organic EL layer.

Regarding Claim 19, Nakayama further discloses that the distance between the semi-reflective surface and the point is adjusted by a thickness of the positive electrode (Figure 3, #103) positioned on the semi-reflecting group side of the light-emission means.

Regarding Claim 20, Nakayama further discloses a spacer layer (Figure 3, #107) on the semi-reflecting group side of the light-emitting layer to adjust the distance between the point and the semi-reflective surface.

Regarding Claim 21, Nakayama further discloses that the negative electrode (Figure 3, #106 and Column 4, Lines 1-14) should be made of a material that exhibits light reflectance.

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Regarding Claim 22, Nakayama further discloses that at least one of the electrode films sandwiched around the organic EL layer should be formed separately and be independently associated with the light-emission region (Figure 3, #103 and Column 3, Lines 61-64).

Regarding Claim 23, Nakayama further discloses that the electrodes should be separated by partition members (See separation of electrodes #103 in Figure 3).

Regarding Claim 24, Nakayama further discloses that the negative electrode (Figure 3, #106) should be separated in association with the light-emission regions and that the thickness of the positive electrodes (#103) should be altered to adjust the distance between semi-reflective surface and the interval point.

Regarding Claim 25, Nakayama further discloses that the positive electrode (Figure 3, #103) should be separated in association with the light-emission regions and that the thickness thereof should be altered to adjust the distance between semi-reflective surface and the interval point.

Regarding Claim 26, Nakayama further discloses that a drive circuit should drive the electrode films (Column 4, Lines 4-9).

Regarding Claims 27 and 28, Nakayama further discloses an electronic apparatus with pixels formed for displaying images (Column 4, Lines 4-9).

9. Claim 29 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by U.S. Patent No. 5,949,187 to Xu.

Xu discloses an interference mirror comprising a plurality of interference reflecting layers (Figure 1, #'s 21, 26, and 28) configured to reflect some light of mutually different

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wavelengths and positioned sequentially in the direction of the optical axis and further comprising gap adjustment layers (Figure 1, #'s 25 and 27) positioned between the interference reflecting layers.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 5, 10, 11, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,554,911 to Nakayama.

Regarding claims 5 and 10, Nakayama discloses the claimed invention except for the limitation that the optical cavity and semi-reflecting layers fit the formulae claimed. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. Thus, it would have been obvious to one of ordinary skills in the art at the time the invention was made to produce an optical cavity and semi-reflective layer to meet the formulae claimed, since discovering an optimum value of a result variable is considered within the skills of the art.

Regarding claim 11, Nakayama discloses the claimed invention except for the limitation that the gap adjustment layers should be formed between the semi-reflecting layers rather than between the semi-reflecting surface (Figure 3, semi-reflecting layer #102 and gap adjustment

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layer #107) and the light-emitting layer (#105) as taught by Nakayama, however, it is noted that the location of such a of such gap adjustment layers is not shown to solve any problems or yield any unexpected results that are not within the scope of Nakayama's (device). Accordingly, the inclusion of such gap adjustment layers is considered to be an obvious matter of design choice.

Regarding claim 16, Nakayama discloses the claimed invention except for the limitation that the point defining one end of the optical cavity should coincide with the maximum electric field, however, it is noted that the location of such a point is not shown to solve any problems or yield any unexpected results that are not within the scope of Nakayama's (device). Accordingly, the position of such is considered to be an obvious matter of design choice.

12. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,554,911 to Nakayama in view of U.S. Patent No. 5,949,187 to Xu.

Nakayama discloses the light-emitting device of Claims 1 and 15 as described above. Nakayama fails to exemplify that there should also be an electron transport layer on the negative electrode side of the organic EL layer.

Xu in a similar device teaches that an electron transport layer should be used on the negative electrode side of the organic EL layer in order to better define the region for light emission.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to use the electron transporting layer of Xu in the device taught by Nakayama in order to better define the region for light emission.

Allowable Subject Matter

13. Claims 6 and 7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and to overcome the 112 rejections.

14. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 6, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 6, and specifically comprising the limitation that the point be located within the light emitting means.

Regarding claim 7, claim 7 would be allowable for the reasons given in claim 6 because of its dependency status from claim 6.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Phinney whose telephone number is (703) 305-3999. The examiner can normally be reached on M-F 7:30-4:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (703) 305-4794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 872-9319 for After Final communications.

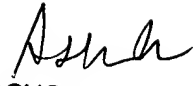
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

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JP 
July 8, 2003


ASHOK PATEL
PRIMARY EXAMINER